CLAIMS

1. A method of manufacturing a dental prosthesis, characterized by comprising:

a step of preparing a substrate of the dental prosthesis that is constituted by a dental molding material;

a step of forming a back coating layer on at least a part of a surface of the substrate, by using a first porcelain that is constituted principally by ceramic;

a step of forming a casting mold such that the substrate is disposed in the casting mold and such that a predetermined void is provided on a surface of the back coating layer; and

a step of forming a cast coating layer on at least a part of a surface of the back coating layer, by pouring a second porcelain into the void at a predetermined casting temperature, the second porcelain being constituted principally by ceramic whose composition is different from that of the ceramic of the first porcelain and being characterized in that viscosity thereof at the predetermined casting temperature is lower than that of the first porcelain.

2. The method of manufacturing the dental prosthesis according to claim 1,

wherein the casting mold forming step includes:

a sub-step of forming, on at least a part of the surface of the back coating layer, a model layer made of a material that is eliminable by burning thereof;

a sub-step of embedding the model layer in a matrix constituting the casting mold; and

a sub-step of forming the casting mold, which is provided with the void corresponding to the model layer, by burning and eliminating the model layer after hardening the matrix.

3. The method of manufacturing the dental prosthesis according to claim 1, wherein the substrate is a frame made of metal or ceramic.

4. The method of manufacturing the dental prosthesis according to claim 1, wherein the first porcelain is provided by a porcelain whose viscosity at the casting temperature is at least 1.5 times as high as that of the second porcelain.

5. The method of manufacturing the dental prosthesis according to claim 1,

wherein the first porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows:

SiO_2 40-75 (mass %);
Al_2O_3 10-20 (mass %);
K_2O 5-15 (mass %);
Na_2O 2-10 (mass %);
Li_2O 0.1-2 (mass %);
ZrO_2 0-7 (mass %);
CaO 0-5 (mass %);
MgO 0-5 (mass %); and
SnO_2 0-30 (mass %);

wherein the second porcelain has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows:

SiO_2 60-70 (mass %);
Al_2O_3 10-20 (mass %);
K_2O 5-15 (mass %);
Na_2O 3-15 (mass %);
Li_2O 0.1-3 (mass %);
ZrO_2 0-3 (mass %);
CaO 0.1-5 (mass %);
MgO 0.1-5 (mass %);
B_2O_3 0-3 (mass %);
CeO_2 0-3 (mass %); and
Sb_2O_3 0-7 (mass %).

6. The method of manufacturing the dental prosthesis according to claim 1, wherein the viscosity of the first porcelain at the

casting temperature ranges from 2×10^6 (cP) to 5×10^7 (cP), while the viscosity of the second porcelain at the casting temperature ranges from 1×10^6 (cP) to 3×10^7 (cP).

7. A kit for forming, on a surface of a substrate of a dental prosthesis, an armored portion constituted by at least two coating layers, the kit comprising:

a first material constituted principally by ceramic for preparing a first porcelain that forms a back coating layer on the surface of the substrate; and

a second material constituted principally by ceramic for preparing a second porcelain that forms, by casting, a coating layer on a surface of at least a part of the back coating layer, the second porcelain is characterized in that viscosity thereof at a predetermined casting temperature is lower than that of the first porcelain constituted by the first material.

8. The kit according to claim 7, wherein the first and second materials are prepared such that the viscosity of the first porcelain at the casting temperature is at least 1.5 times as high as that of the second porcelain.

9. The kit according to claim 7,

wherein the first material has, as a main component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows:

SiO_2 40-75 (mass %);
Al_2O_3 10-20 (mass %);
K_2O 5-15 (mass %);
Na_2O 2-10 (mass %);
Li_2O 0.1-2 (mass %);
ZrO_2 0-7 (mass %);
CaO 0-5 (mass %);
MgO 0-5 (mass %); and
SnO_2 0-30 (mass %);

wherein the ceramic of the second material has, as a main

component, a glass composition that is essentially constituted by oxides having respective percentage contents as follows:

SiO_2	60-70 (mass %);
Al_2O_3	10-20 (mass %);
K_2O	5-15 (mass %);
Na_2O	3-15 (mass %);
Li_2O	0.1-3 (mass %);
ZrO_2	0-3 (mass %);
CaO	0.1-5 (mass %);
MgO	0.1-5 (mass %);
B_2O_3	0-3 (mass %);
CeO_2	0-3 (mass %); and
Sb_2O_3	0-7 (mass %).

10. The kit according to claim 7, wherein the first and second materials are prepared such that the viscosity of the first porcelain at the casting temperature ranges from 2×10^6 (cP) to 5×10^7 (cP), while the viscosity of the second porcelain at the casting temperature ranges from 1×10^6 (cP) to 3×10^7 (cP).

11. A method of manufacturing a dental prosthesis, by fixing at least two ceramic layers onto a surface of a frame made of zirconia, wherein steps of forming the ceramic layers are characterized by comprising:

a first step of fixedly forming, on the surface of the frame, a first ceramic layer (14; 60) of a predetermined first composition which contains, as main components, 66.0-72.0 (mass %) of SiO_2, 13.5-17.8 (mass %) of Al_2O_3, 0.05-0.31 (mass %) of Li_2O, 1.3-6.5 (mass %) of Na_2O, 8.7-12.5 (mass %) of K_2O, 0.1-0.5 (mass %) of CaO, 0.01-0.22 (mass %) of MgO, 0.1-0.6 (mass %) of Sb_2O_3, 0-3 (mass %) of CeO_2, 0-3 (mass %) of B_2O_3 and 0-3 (mass %) of SrO; and

a second step of fixedly forming, on a surface of the first ceramic layer, a second ceramic layer (36; 66) of a predetermined second composition which contains, as main components, 63.0-69.0 (mass %) of SiO_2, 14.8-17.9 (mass %) of Al_2O_3, 0.02-0.28 (mass %) of Li_2O, 1.5-6.8 (mass %) of Na_2O, 8.0-14.0 (mass %) of K_2O, 0.2-1.5 (mass %) of CaO, 0.05-0.55 (mass %)

of MgO, 0.2-2.2 (mass %) of Sb_2O_3, 0.1-3 (mass %) of CeO_2, 0.1-3 (mass %) of B_2O_3 and 0-3 (mass %) of SrO, such that the first ceramic layer is covered at its surface with the second ceramic layer.

12. The method of manufacturing the dental prosthesis according to claim 11, wherein viscosity of the first ceramic layer at a temperature of heat treatment for forming the second ceramic layer in the second step, is higher than that of the second ceramic layer.

13. The method of manufacturing the dental prosthesis according to claim 11, wherein the second step for forming the second ceramic layer is implemented by filling, with a predetermined fluidity material, a predetermined void whose inner wall surface is partially constituted by the surface of the first ceramic layer.

14. The method of manufacturing the dental prosthesis according to claim 13, wherein the second step is implemented by filling the void with the fluidity material whose fluidity is increased by heating the fluidity material.

15. The method of manufacturing the dental prosthesis according to claim 13, wherein the first step for forming the first ceramic layer is implemented by filling, with a predetermined fluidity material, a predetermined void whose inner wall surface is partially constituted by the surface of the frame.

16. The method of manufacturing the dental prosthesis according to claim 11, wherein each of the first and second ceramic layers has coefficient of thermal expansion ranging from 9.1×10^{-6} (/°C) to 10.3×10^{-6} (/°C) at a temperature ranging from 25 (°C) to 500 (°C).

17. A dental porcelain set used for manufacturing a dental prosthesis by fixedly forming at least two ceramic layers on a surface of a frame made of zirconia, the dental porcelain set being constituted by at least two kinds of porcelains for forming the ceramic layers, the dental porcelain set being characterized by comprising:

a first porcelain forming a first composition which contains, as expressed in terms of oxide, main components in the form of 66.0-72.0 (mass %) of SiO_2, 13.5-17.8 (mass %) of Al_2O_3, 0.05-0.31 (mass %) of Li_2O, 1.3-6.5 (mass %) of Na_2O, 8.7-12.5 (mass %) of K_2O, 0.1-0.5 (mass %) of CaO, 0.01-0.22 (mass %) of MgO, 0.1-0.6 (mass %) of Sb_2O_3, 0-3 (mass %) of CeO_2, 0-3 (mass %) of B_2O_3, and 0-3 (mass %) of SrO; and

a second porcelain forming a second composition which contains, as expressed in terms of oxide, main components in the form of 63.0-69.0 (mass %) of SiO_2, 14.8-17.9 (mass %) of Al_2O_3, 0.02-0.28 (mass %) of Li_2O, 1.5-6.8 (mass %) of Na_2O, 8.0-14.0 (mass %) of K_2O, 0.2-1.5 (mass %) of CaO, 0.05-0.55 (mass %) of MgO, 0.2-2.2 (mass %) of Sb_2O_3, 0.1-3 (mass %) of CeO_2, 0.1-3 (mass %) of B_2O_3, and 0-3 (mass %) of SrO.

18. The dental porcelain set according to claim 17, wherein each of the first and second porcelains has, after burning thereof, coefficient of thermal expansion ranging from 9.1×10^{-6} (/°C) to 10.3×10^{-6} (/°C) at a temperature ranging from 25 (°C) to 500 (°C).

19. The dental porcelain set according to claim 17, wherein each of the first and second porcelains is prepared by: mixing compounds which generate oxides at a predetermined glass melting temperature; melting the mixture by heating the mixture; crushing the mixture; subjecting the mixture to a heat treatment that is carried out at a predetermined temperature such that leucite crystal is precipitated; adding pigment and fluorescent material to the mixture; and crushing the mixture.